10.0 TECHNICAL AREA 21 TRACT

10.1 Affected Environment

10.1.1 Land Use

Technical Area 21 (TA 21) consists of about 260 acres (105 hectares) at the eastern end of DP Mesa, near the central business district of the Los Alamos townsite. The tract is located between Los Alamos Canyon to the south, and DP Canyon to the north (see Figure 10.1.1-1, Technical Area 21 Tract Layout). The southern and northern boundaries of the tract extend to the bottom of the two canyons that define the mesa. The west-central portion of the tract contains the majority of the development at the tract in terms of buildings and structures. The remaining portions of the tract consist of sloped areas, some of which would likely not accommodate development (slopes greater than 20 percent). Access to the site is via DP Road, which splits the mesa north and south (DOE 1998b). The mesa top, while previously disturbed, remains moderately vegetated with native grasses, shrubs, and small trees (DOE 1997a).

TA 21 is among the oldest technical areas at LANL and is the site of the former plutonium processing facility (DOE 1998b). The tract contains roads, water towers, and other structures that support the 10 primary buildings on the east end of the mesa (LANL 1990). Each of the 10 primary buildings is 10,000 square feet (1,000 square meters) or more in size.

Existing land use is dominated by activities at TA 21's two primary research areas: DP East and DP West. DP East is an area of ongoing tritium research and includes the Tritium Systems Test Assembly (TSTA), and the Tritium Science and Fabrication Facility (TSFF). These two facilities are scheduled to operate beyond the year 2007. DP West has been in decontamination and decommissioning (D&D) since 1992. Nearly half of the site has been demolished, and the remainder is scheduled for D&D in the coming years (DOE 1998b). Access is restricted in LANL operational and buffer areas. An office building with light biological laboratories with unrestricted access is located on the west end of the tract.

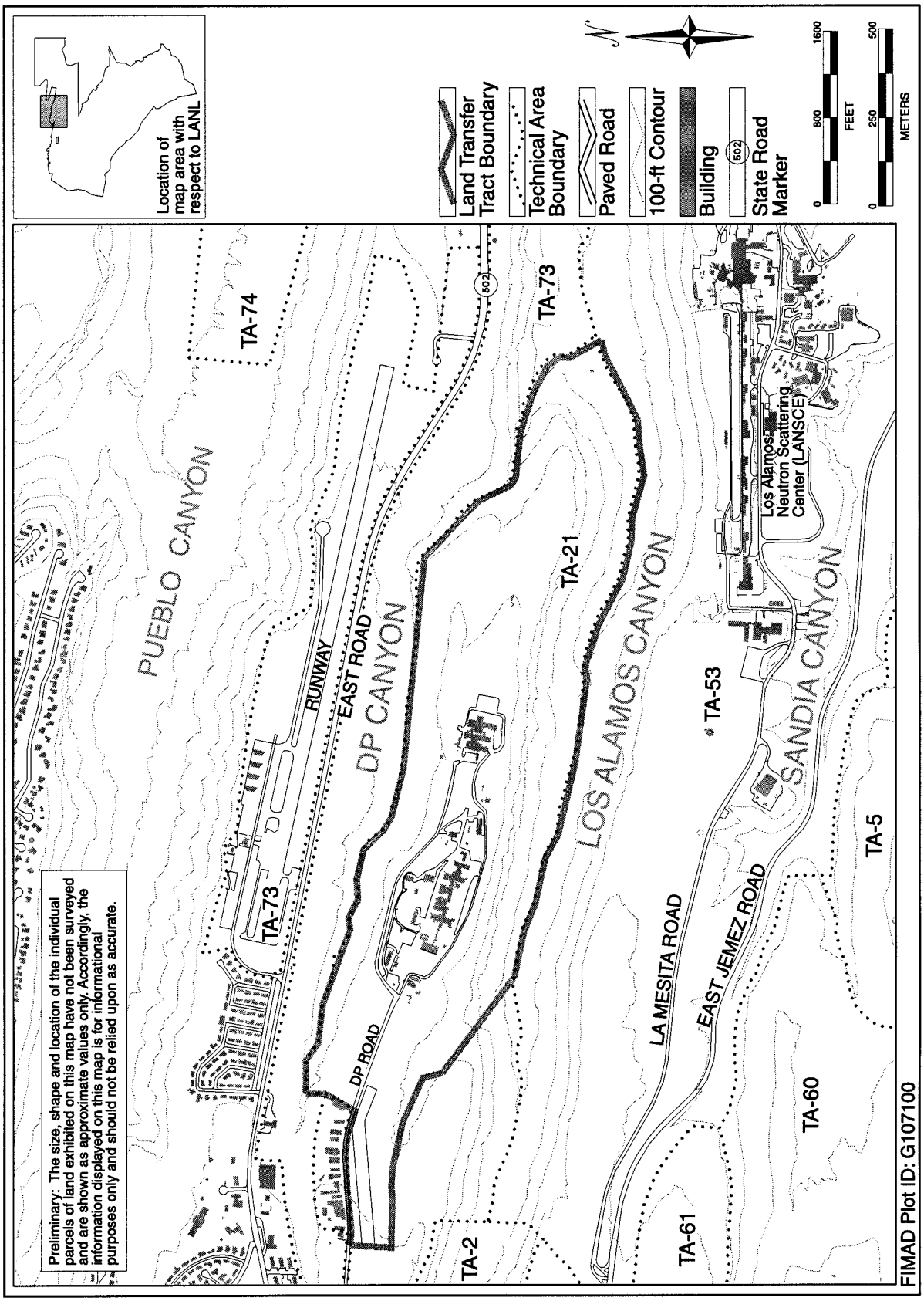

Figure 10.1.1-1. Technical Area 21 Tract Layout.

Adjacent land use includes the businesses located to the west along DP Road, which are based on a mixture of heavy commercial uses, including automotive repair shops, machine shops, and the Los Alamos County Fire Department training facility. Commercial and light industrial uses such as those associated with the *Los Alamos Monitor* newspaper and a local hardware store also are present (LAC 1998). To the south of DP Road, development is limited to vehicle and equipment storage areas. The Los Alamos Airport is located immediately to the north of the TA 21 Tract, across DP Canyon and State Road 502 (DOE 1998b).

The Mattie Brook Trail bisects the tract east and west, and the Los Alamos Canyon Trail skirts the southern perimeter (see Figure 3.2.1-2 in Chapter 3). The two trails connect at the southeast edge of the tract (LANL 1998c). Access to the trails is currently restricted from TA 21. No other recreational opportunities currently exist within the boundary of the site.
Figure 10.1.1-2 shows the various LANL media monitoring stations located in or at the TA 21 Tract.

10.1.1.1 Environmental Restoration

TA 21 is one of the oldest technical areas at LANL, and its uses have included plutonium processing, tritium research, and the treatment of radioactive liquids. As a result, the tract has substantial environmental contamination. There are a total of 154 potential release sites (PRSs) within 50 feet (15 meters) of the boundaries of the tract. The PRSs fall within five categories: 88 surface units, 34 subsurface units, 21 outfalls, 9 material disposal areas (MDAs), and 2 stack emissions. The latter include incinerators and filter houses and will require the assessment of the entire tract for elevated contamination levels. A total of 95 of the 154 PRSs have been partially sampled, the beginning of the process of characterizing the nature and extent of contamination from historical activities.

There also are 125 structures identified (to date) for decommissioning. These include electrical substation sheds, wastewater treatment facilities, research facilities, and processing facilities. The structures at TA 21 fall within four categories (Types II through VI) based on the estimated cost per unit area anticipated for their decommissioning.

In addition to PRSs and structures, portions of Los Alamos and DP Canyons lie within the boundaries of the TA 21 Tract. Although these canyon areas are not suitable for development, they also may contain contamination that must be characterized and/or remediated.

Figure 10.1.1.1-1 shows areas with the potential contamination issues (PCIs) within this tract. The TA 21 Tract has numerous PRSs, many of which have not yet been characterized. Much of the land around the sites also may be contaminated from prior LANL operations. The MDAs within the tract boundaries may be involved in future remediation activities and prove very costly as well. As a result, PCI acreage is estimated to total almost the entire tract.

10.1.2 Transportation

The existing collector road (DP Road) that serves this tract (see Figure 10.1.1-1) has the capability to service approximately 2,000 passenger cars per hour (pcph) in both directions. DP Road can be accessed from Trinity Drive (see Figure 9.1.1-1 in Chapter 9), a four-lane major road west of DP Road, and from the east by a two-lane highway (State Road 502) and East Road.

Trinity Drive currently has an approximate capacity of 7,200 pcph, and East Road has a capacity of approximately 2,400 pcph. Data provided by the County of Los Alamos show that Trinity Drive and

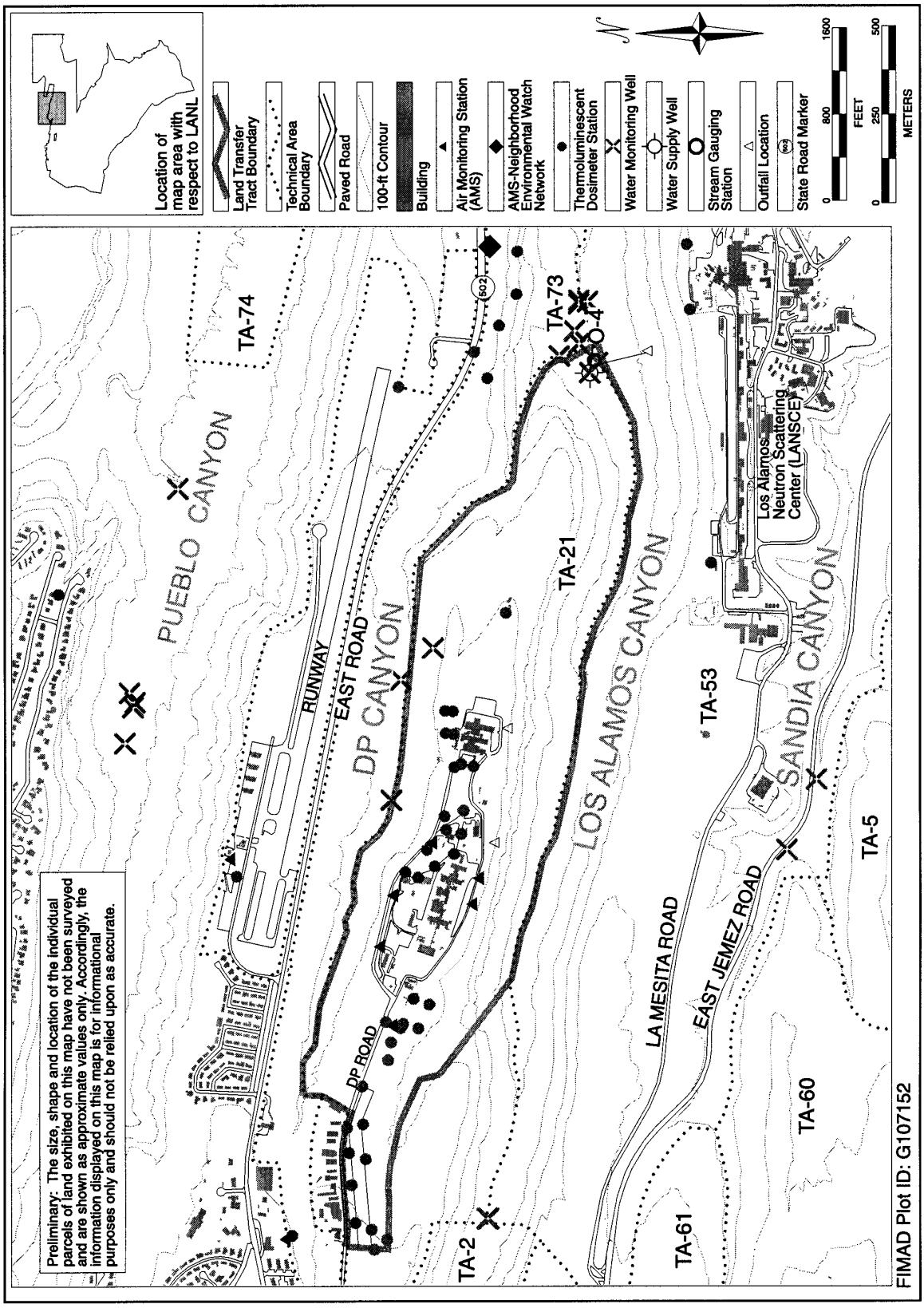

Figure 10.1.1-2. Technical Area 21 Tract Monitoring Stations and Outfall Locations.

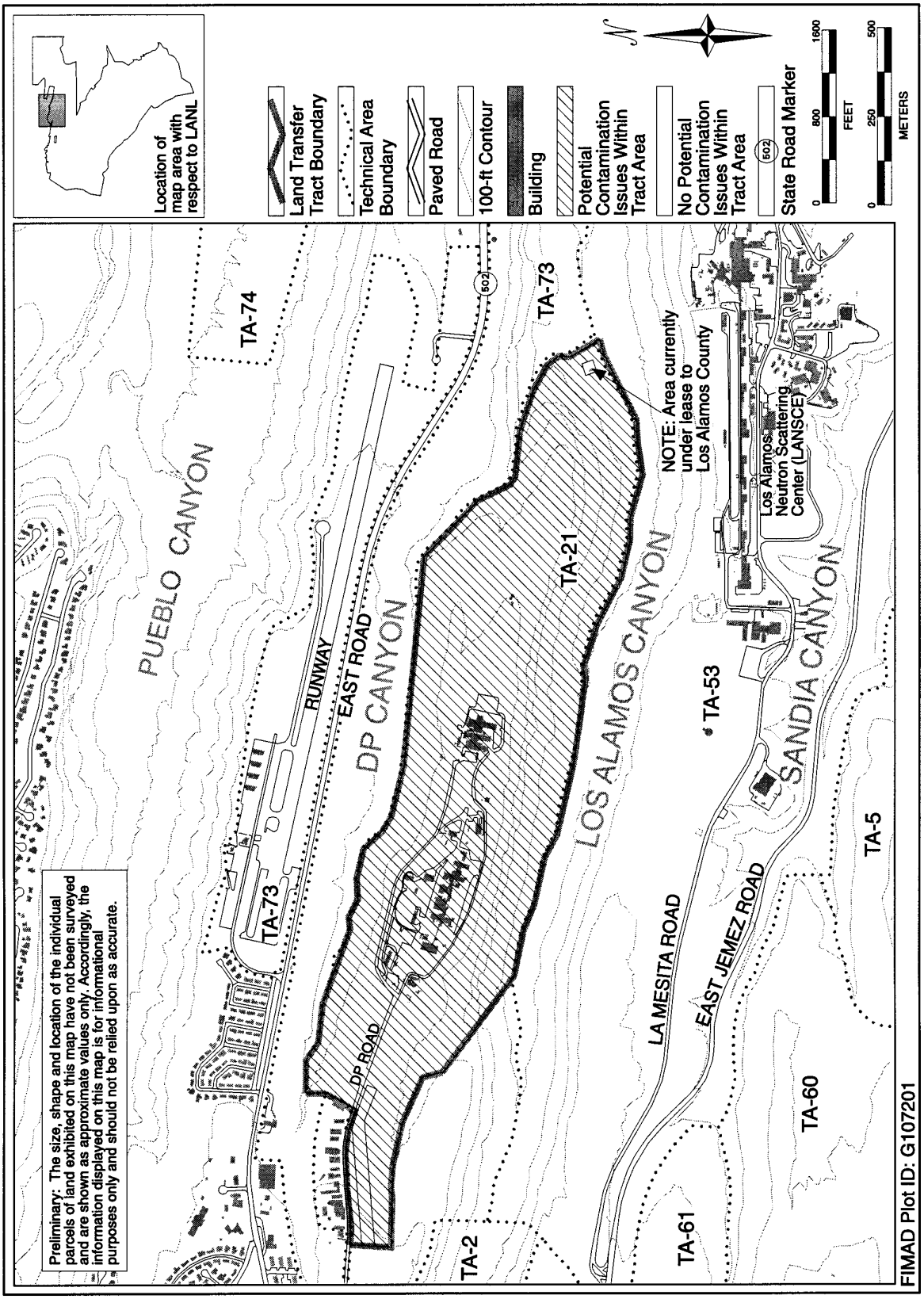

Figure 10.1.1.1-1. Technical Area 21 Tract Potential Contamination Issue Areas.

East Road carried approximately 1,100 vehicles in the peak hour near the vicinity of DP Road in January 1998. The average annual traffic on Trinity Road and East Road near the site is approximately 10,350 vehicles per day. This results in a level of service (LOS) D for the two-lane highway, which is defined as below average operating conditions approaching "stop and go" traffic flow. The two-lane section of these roads was evaluated because it is the constraint for roadway operation.

Increasing Trinity Drive and East Road traffic to account for expected growth in the area over the next 20 years degrades operation to LOS E in the year 2018. This LOS represents the maximum capacity of the road and is the operating condition just prior to traffic jam conditions.

The intersection of DP Road and Trinity Drive is a blind curve. Westbound Trinity Drive traffic, a one-lane section at this location, does not have a clear view of eastbound traffic. The room for turning onto DP Road and from DP Road onto Trinity Drive is currently insufficient, and the turn lane configuration can be confusing.

10.1.3 Infrastructure

Figure 10.1.3-1 shows the location of structures, roads, and utility lines for the TA 21 Tract. Industrial and security fence lines are shown on Figure 10.1.3-2. TA 21 contains all the major utilities, including water, sewer, steam, electrical, gas, and a radioactive liquid waste (RLW) line. Power lines enter the developed area at the midpoint from the south, then run along DP Road and distribute power to the rest of the buildings on the site. A natural gas line enters the TA 21 Tract from the north at the tract's midpoint. A steam plant at TA 21 uses natural gas to produce steam for heating buildings. TA 21 receives water from a supply line entering at the midpoint of the site from the north. This tract is not metered separately for any utilities, and no figures for current utility usage are available.

An RLW line originates from near the middle of the developed area, runs west along DP Road, and exits the site at the western-most boundary. RLW is transported via this line to the RLW Treatment Facility (TA 50). A replacement for the RLW line is currently under development, and the current line is expected to be cleaned and plugged.

10.1.4 Noise

The Los Alamos County Airport is to the north of TA 21 but is separated from TA 21 by DP Canyon, a small tributary of Los Alamos Canyon. TA 53 is to the south but is separated from TA 21 by Los Alamos Canyon. As a result, ambient noise reaching TA 21 comes largely from workers and light trucks traveling to and from LANL facilities. There is slight contribution from traffic along State Road 502, which can be heard when there is no traffic entering TA 21 from DP Road. The takeoff and landing of small airplanes contribute intermittently to noise levels. However, because this tract is further removed from traffic than the neighboring DP Road Tract, ambient noise levels are estimated to be somewhat lower than 50 decibels, A-weighted (dBA).

10.1.5 Visual Resources

The TA 21 Tract consists of a variety of buildings, roads, parking lots, and other associated facilities located on top of the mesa. The side slopes of the mesa are mostly undeveloped and forested. The site, particularly the water tower, can be seen from locations along State Road 502. Somewhat distant views from the site toward the west include the Jemez Mountains. This tract was analyzed by assigning two rating units to the tract based on the visual characteristics of the undeveloped and developed portions of the

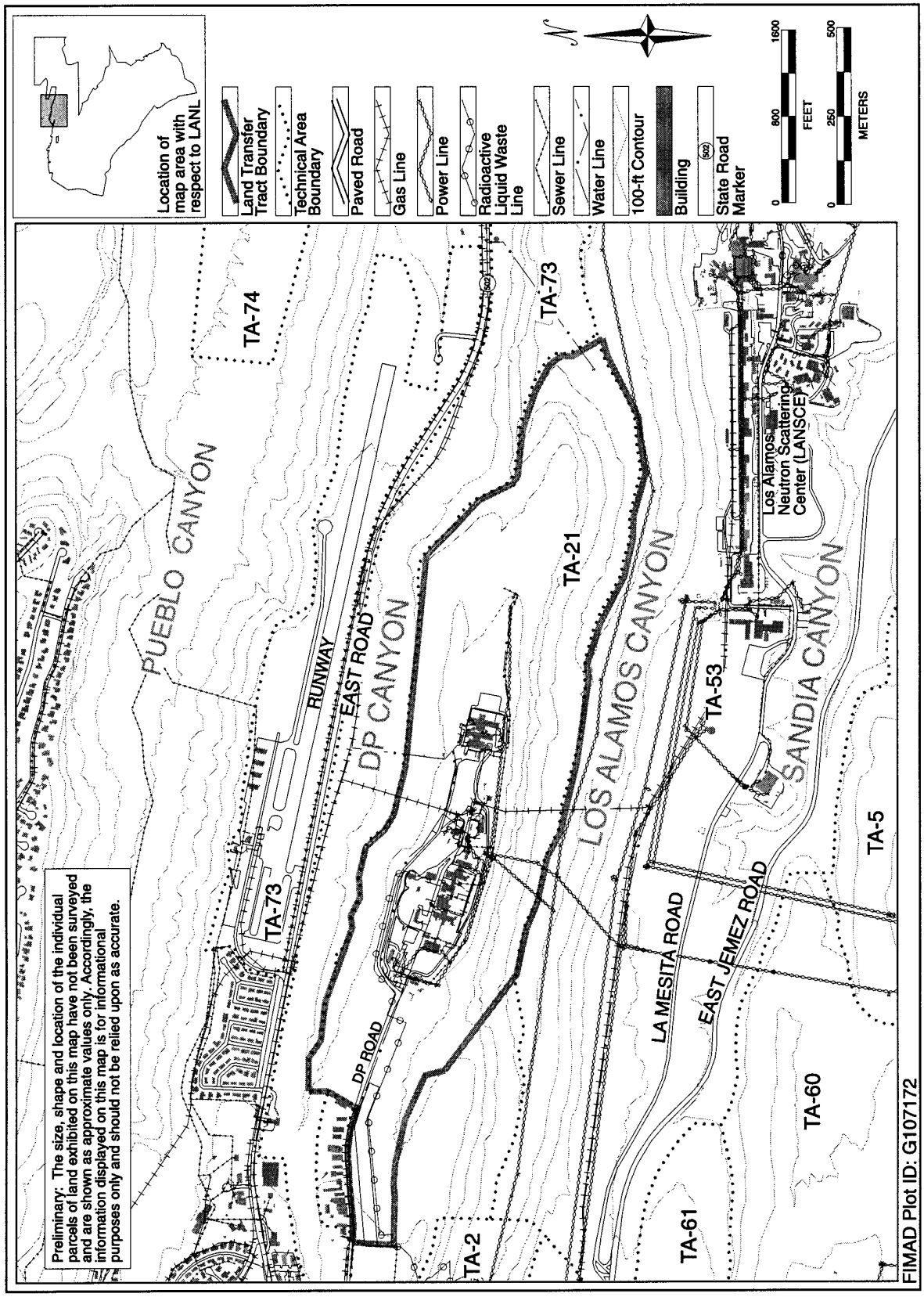

Figure 10.1.3-1. Technical Area Utilities and Infrastructure.

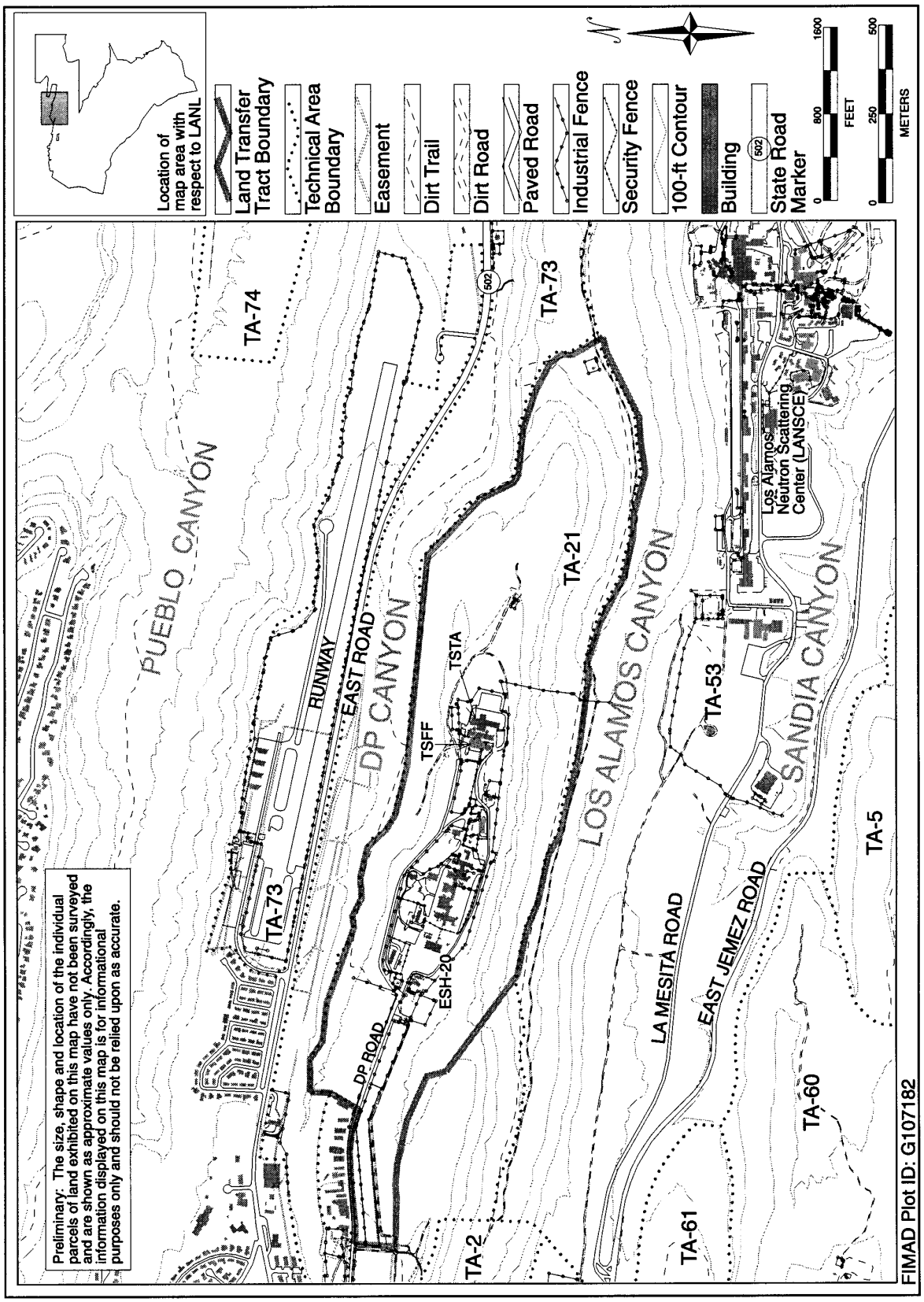

Figure 10.1.3-2. Technical Area 21 Industrial and Security Fence Lines.

site. These areas generally correspond to the side slopes of the mesa, Rating Unit 1, and the top of the mesa, Rating Unit 2.

After scenic quality, distance zone, and sensitivity level components were combined using the Inventory Class Matrix, it was determined that both the developed and undeveloped portions of the site fall into Scenic Class IV, low public value for the visual resources.

10.1.6 Socioeconomics

The most meaningful economic region of influence (ROI) for all of the tracts is the regional setting described in Chapter 3 of this CT EIS. Labor and housing markets extend well beyond any of the tract boundaries affected by the proposed land transfer.

This tract consists of two primary research areas: DP West and DP East. The DP West area has been in the decontamination, decommissioning, and demolition process, and programs located there have been largely been relocated to other areas at LANL. An office building with light laboratories remains. The DP East area is a tritium research site. The tritium activities have not been relocated, and are considered critical to national security and fusion energy research. These activities are anticipated to be required beyond the year 2007.

10.1.7 Ecological Resources

Similar to the DP Road Tract and contiguous with it, the TA 21 Tract supports ponderosa pine forest; pinyon-juniper woodland; and open shrub, grassland, and wildflower areas. Approximately 20 percent of the area is developed as roadways, parking lots, and facilities with associated landscaping. Most of the tract has been disturbed by previous industrial activities. Flora and fauna are characteristic of the region. At least 30 mammal species, including 15 bat species, 80 bird species, 7 reptile and amphibian species, and 154 plant species are present in the vicinity of the tract. Several large game animals, including elk, mule deer, and black bear use the area. There are no identified floodplains within the tract. TA 21 has wetlands within its current boundaries. A review of the U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) and wetland mapping data of the LANL indicated the presence of wetlands in TA 21. At some time in the past, industrial outfalls have since been decommissioned and closed. Eventually, these associated wetlands will transition to dry land vegetation. A small (less than 1 acre or 1 hectare) willow-dominated wetland exists in the bottom of DP Canyon near the top of the drainage. With currently designated conveyance and transfer tract boundaries, portions of this wetland exist in both the Airport Tract and the TA 21 Tract. See Appendix D of this CT EIS for further description of wetlands and floodplains. Adjacent Los Alamos Canyon contains a perennial water source flowing a few cubic feet per second during most of the year that support stretches of riverine and palustrine wetlands. The TA 21 Tract contains suitable habitat for the American peregrine falcon, bald eagle, and Mexican spotted owl. Three Mexican spotted owl areas of environmental interest (AEIs) overlap this land tract, and two American peregrine falcon AEIs are also present and overlapping.

Noise in the vicinity of the DP Tract results from traffic on East Road, Trinity Drive, and DP Road, as well as TA 21 activities conducted in the area. DP Road and TA 21 are lighted at night by security lighting and by commercial lighting from adjacent developed areas.

10.1.8 Cultural Resources

TA 21 was used from the Coalition period through the Nuclear Energy period. Prior to DOE use, this tract was part of the Ramon Vigil Spanish land grant. The ROI for this tract includes the land tract itself, plus nearby

cultural resources located off the tract. For this tract, these nearby resources are located on LANL and privately held lands.

One hundred percent of the TA 21 Tract has been inventoried for historic and prehistoric resources. Survey results indicate that there are 44 cultural resources within the tract. Two of these sites are prehistoric and 42 are historic. One prehistoric site has been evaluated as eligible for the National Register of Historic Places (NRHP), and the other has been excavated and does not retain sufficient data potential currently to be considered eligible. One of the historic sites is NRHP-eligible and another is considered potentially eligible. The remaining 40 historic sites are LANL buildings associated with the historic developments during the Nuclear Energy period. These buildings have been preliminarily evaluated as potentially eligible for the NRHP. It is unlikely that all of the TA 21 buildings will be determined as NRHP-eligible resources. There also is a potential for unidentified resources, including subsurface archaeological deposits and unrecorded burials in TA 21.

There are no known traditional cultural properties (TCPs) located within the TA 21 Tract. Consultations to identify TCP resources have not been conducted. TCPs may be identified during further consultations with Native American and Hispanic groups regarding the traditional uses of this tract. TCPs would not be anticipated in developed parts of the tract.

Additional information on the cultural resources of the TA 21 Tract is presented in Appendix E of this CT EIS.

10.1.9 Geology and Soils

The southern and northern boundaries of the TA 21 Tract extend to the bottom of the two canyons that consist of exposed Bandelier Tuff and Totavi gravelly loamy soil. The west-central portion of the tract contains the majority of the development at the tract in terms of buildings and structures. The remaining portions of the tract consist of sloped areas, some of which would not likely accommodate development (slopes greater than 20 percent). The mesa top, while previously disturbed, is typified by the Pogna fine sandy loam soil type and steep rock outcrops along the canyon rim. Outcrops are the upper member of the Bandelier Tuff (Tshirege), typical of the Pajarito Plateau. No major surface faulting is evident in TA 21, but fracturing along the canyon edge is common in the area. Existing structures are vulnerable to greater than magnitude 7 seismic events (as measured on the Richter scale) and wildfire episodes.

10.1.10 Water Resources

Figure 10.1.1-1 shows the location of the TA 21 Tract, which includes the mesa top and adjacent canyons. Both canyons are ephemeral drainages in the vicinity of the tract and receive stormwater runoff and snowmelt from the mesa top and surrounding areas. There are no known springs within the tract. DP Spring flows from the DP Canyon wall adjacent to the tract but does not maintain flow into the canyon bottom.

The USFWS NWI and LANL identify wetlands within the TA 21 Tract. Wetlands assessments are provided in Appendix D. There are two active National Pollutant Discharge Elimination System (NPDES)-permitted outfalls within the tract associated with the TSFF and the steam plant. These outfalls will be deleted when the source of discharge has been eliminated. There is one regional aquifer supply well within the tract and one regional aquifer test well several hundred feet northeast of the tract (see Figure 10.1.1-2). There is an NPDES-permitted outfall associated with the supply well.

There are no stream gages within the TA 21 Tract. There are two surface water monitoring stations located within the tract,

DPS-1 and DPS-4. There are groundwater monitoring stations within the tract in Los Alamos and DP Canyon, but these are for shallow and intermediate perched groundwater zones and do not pertain to the regional aquifer water supply associated with this tract. Portions of the TA 21 Tract that lie within the canyon bottoms are in the 100-year floodplain. Assessment of floodplains is included in Appendix D.

10.1.11 Air Resources

Air quality at the TA 21 Tract is primarily affected by LANL operations at TA 21 and at the Los Alamos Neutron Science Center (LANSCE) on the mesa immediately to the south. Slight pollution contributions also arise from automobiles using DP Road and Trinity Drive and commercial activities along DP Road.

The TA 21 Tract is part of New Mexico Region 3, an attainment area that meets National Ambient Air Quality Standards (NAAQS) for criteria pollutants. Five criteria pollutants are emitted from the steam plant within TA 21. The only other emissions of criteria pollutants are small amounts of carbon monoxide and ozone resulting from hydrocarbons emitted from motor vehicles.

The steam plant burns fuel oil and has a peak rating of 140,000 British thermal units (BTUs) per hour. Plant emissions at peak load have been estimated as shown in Table 10.1.11-1. It has been estimated, however, that these emissions are within air quality standards (DOE 1999c, Appendix B).

All emissions of hazardous and other chemical air pollutants at the TA 21 Tract are from LANL activities. Emissions from the LANSCE at TA 53 on the neighboring mesa, also could affect air pollution concentrations at TA 21. Analysis shows that about 130 different chemicals have been or are being used at TA 21, and about 90 at the LANSCE. For chemical emissions from activities at both of these technical areas, however, short-term exposures resulting from inhalation of chemical air pollutants at points along the current boundaries of the technical areas were all estimated to be less than health-based standards, and there are no anticipated adverse health effects. Likewise, long-term exposures (such as for sensitive receptors in Los Alamos and nearby areas) also were estimated to be less than health-based standards (DOE 1999c, Chapter 5).

Table 10.1.11-1. Steam Plant Emissions

CRITERIA POLLUTANT	PEAK EMISSIONS
Carbon monoxide	0.4 lb/hr (0.05 g/sec)
Nitrogen dioxide	1.7 lb/hr (0.22 g/sec)
Sulfur dioxide	4.1 lb/hr (0.52 g/sec)
Total suspended particulates	0.2 lb/hr (0.02 g/sec)
PM-10	0.1 lb/hr (0.01 g/sec)

Notes: lb/hr = pounds per hour, g/sec = grams per second, PM-10 = particulate matter less than 10 microns in size

Analyses for doses from radioactive air pollutants indicate that air concentrations at the TA 21 Tract would deliver a dose of approximately 1.5 to 3.0 millirem per year to people residing there year-round, or up to 30 percent of the EPA standard (DOE 1999c, Chapter 5).

10.1.11.1 Global Climate Change

About 240,000 square feet (22,296 square meters) of TA 21 structures are heated. In addition to space and water heating needs, research conducted at some of these facilities requires process steam. Maintenance and research activities also require the use of several government vehicles. These activities result in estimated emissions of 7,400 tons (6,712 metric tons) of carbon dioxide

annually. Other greenhouse gases are emitted in very small quantities or not at all.

10.1.12 Human Health

10.1.12.1 The Radiological Environment for the TA 21 Tract

TA 21 is the land tract closest to LANSCE, which is the primary source of radioactive emissions as measured by the LANL offsite maximally exposed individual (MEI). The eastern tip of this land tract is about the same distance from the LANSCE as the MEI. This tract also has operational tritium facilities that have airborne radioactive emissions (TSTA and TSFF) and maintain some radioactive materials inventory (tritium) that could be at risk during a natural disaster or other accident.

This is an industrial complex, so there are no residents. Therefore, the dose to visitors (including joggers and hikers) from the LANSCE are much less than the MEI effective dose equivalent (EDE) annual dose. Other potential radiological exposures include direct radiation from the TA 21 MDAs. Visitors also are assumed to be Los Alamos residents who would receive the area background dose. Radiological PRSs and other sources of contamination exist on this site, but these have not been completely characterized. This tract has the highest potential radiation dose of all the land tracts considered for conveyance or transfer because of the existing operations, MDAs, and proximity to the LANSCE.

The LANL SWEIS projects radiological doses to the MEI of 3.1 millirem per year at the Small Business Center Annex (on East Gate Drive) and from 1.4 millirem (at its western edge) to 3.0 millirem (at its eastern edge) per year at the TA 21 Tract (DOE 1999c, Chapter 5). Doses are thus within the EPA standard of 10 millirem per year. The TA 21 Tract lies within two of LANL's one-half mile radiation site evaluation circles (see Figure 10.1.12.1-1) due to activities at the LANSCE on the neighboring mesa and at TA 21 itself. The radiation site evaluation circles were included in LANL's 1990 Site Development Plan (LANL 1990). These circles were intended to be used as planning tools for site developers and other project managers responsible for siting new facilities or operations to inform them of the presence of existing radiation sources and the need to evaluate their proposed action(s) against this information. The circles are not representative of a particular dose of radiation to the TA 21 Tract under either normal or accident conditions and are noted herein for the purposes of disclosure with regard to the nearest radiation source location relative to the tract. The quantities of radioactive material and other sources of radiation identified by these radiation evaluation circles were evaluated in the 1999 LANL SWEIS, as previously discussed.

10.1.12.2 The Nonradiological Environment for the TA 21 Tract

Exposures to nonradiological contaminants via the airborne pathway in the LANL vicinity have already been shown not to be significant for the affected environment (DOE 1999c). PRSs and other contamination on this tract may include nonradiological constituents; the site has not been completely characterized.

It is postulated that two of the three types of natural disasters postulated in the SWEIS could occur on this land (seismic events and wildfire). This site has hazardous materials present in the buildings that could be at risk during a natural disaster.

10.1.12.3 Facility Accidents

Chemical Accidents

The LANL SWEIS posits six chemical accidents, as discussed in Chapter 4, Section 4.1.12 of this CT EIS. For all

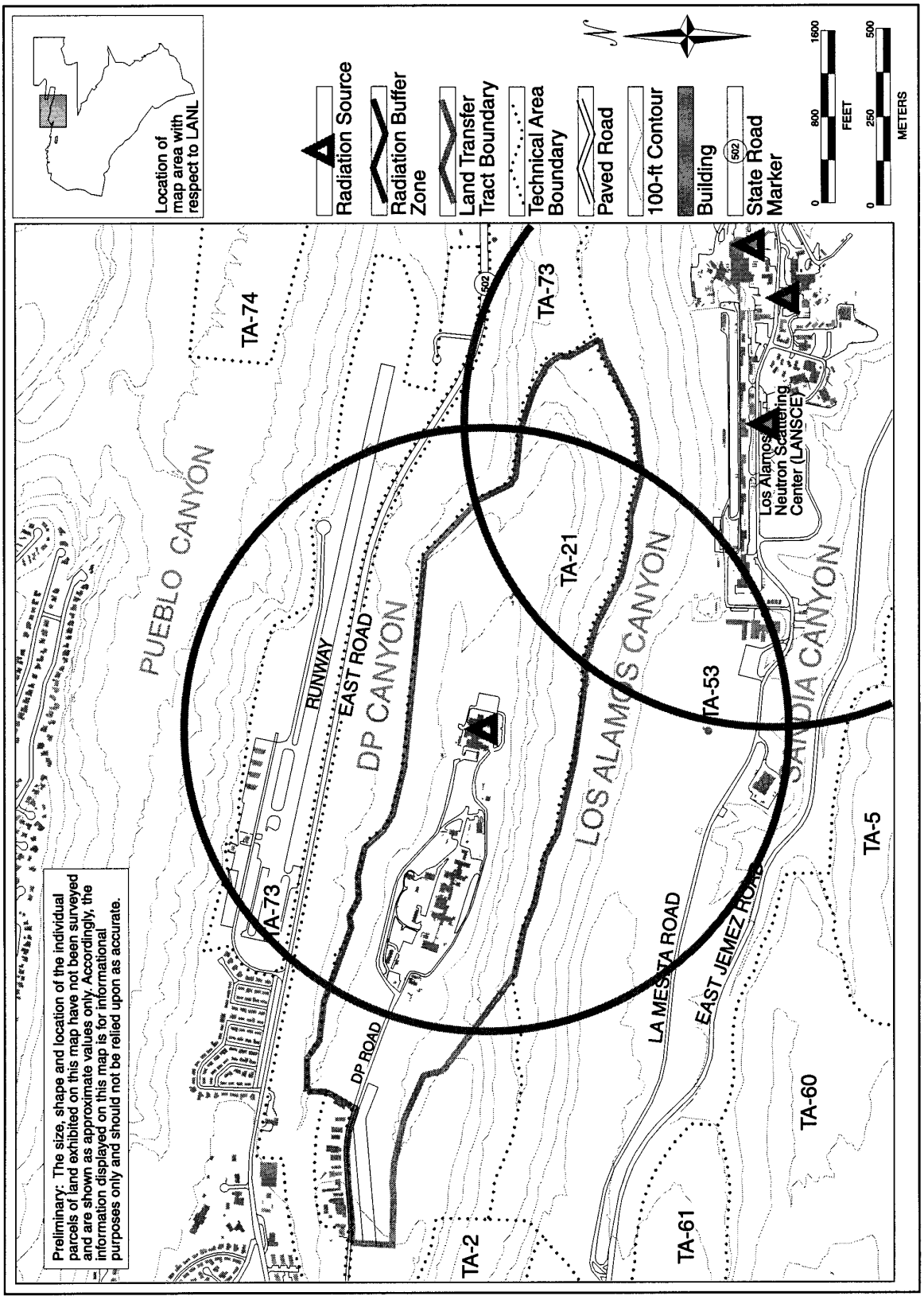

Figure 10.1.12.1-1. Technical Area 21 Radiation Site Evaluation Circles.

postulated accidents, chemical concentrations in the air plume released by the potential accidents would be below both Emergency Response Planning Guideline (ERPG)-3 (life-threatening) and ERPG-2 (serious health effects) by the time air plume reached TA 21, even under adverse weather dispersion conditions. Accordingly, chemical accidents have no estimated public consequences at the tract.

Radiological Accidents

There are 13 credible radiological accident scenarios postulated in the LANL SWEIS, as discussed in Chapter 4, Section 4.1.12 of this CT EIS. Using data from the LANL SWEIS, doses to the MEI at TA 21 have been estimated for each of these, as shown in Table 10.1.12.3-1.

Table 10.1.12.3-1. MEI Doses for the TA 21 Tract Resulting from Hypothetical Accidents at LANL Facilities

ACCIDENT SCENARIO	ACCIDENT LOCATION	FACILITY	FREQUENCY PER YEAR	MEI DOSE (mrem)	ACCIDENT DESCRIPTION
RAD-01	54-38	RANT	1.6×10^{-3}	98	Fire in the outdoor container storage area
RAD-02	03-29	CMR	1.5×10^{-6}	17,000	Natural gas pipeline failure
RAD-03	18-116	Kiva #3	4.3×10^{-6}	84	Power excursion at the Godiva-IV fast-burst reactor
RAD-05	21-209	TSTA	9.1×10^{-6}	NA[a]	Aircraft crash
RAD-07	50-69	WCRR	3.0×10^{-4}	220	Fire in the outdoor container storage area
RAD-08	54-230	TWISP	4.3×10^{-6}	120	Aircraft crash
RAD-09A	54-226	TWISP	4.9×10^{-1}	1	Puncture or drop of average-content drum of transuranic waste
RAD-09B	54-226	TWISP	4.9×10^{-3}	75	Puncture or drop of high-content drum of transuranic waste
RAD-12	16-411	--	1.5×10^{-6}	8,000	Seismic-initiated explosion of a plutonium-containing assembly
RAD-13	18-116	Kiva #3	1.6×10^{-5}	120	Plutonium release from irradiation experiment at the Skua reactor
RAD-15A	03-29	CMR	3.6×10^{-5}	67	Fire in single laboratory
RAD-15B	03-29	CMR	3.2×10^{-5}	1,200	Fire in entire building wing
RAD-16	03-29	CMR	3.5×10^{-6}	4	Aircraft crash

Notes: mrem = millirem; RANT = Radioactive Assay and Nondestructive Test; CMR = Chemistry and Metallurgy Research; WCRR = Waste Characterization, Reduction, and Repackaging; TWISP = Transuranic Waste Inspectable Storage Project

[a] Not Applicable. Accident could not occur at TA 21 if the land were transferred.

Because there are no residents and no public workers at the tract, the estimated tract collective dose and estimated excess latent cancer fatality (LCF) are both zero.

Natural Event Accidents

There are five natural event accident scenarios postulated in the LANL SWEIS: four earthquakes and one wildfire. The most severe postulated earthquake (accident SITE-03B) has been estimated frequency of 3×10^{-5} per year, or once every 330,000 years. The postulated earthquake scenario would release chemicals from a number of facilities, including formaldehyde from the Health Research Laboratory (HRL) (Building 43-01) and chlorine from the chlorinating station within the Los Alamos townsite (Building 00-1109). As discussed for chemical accidents, earthquakes would have no estimated chemical consequences at TA 21. The most severe earthquake, however, would release significant quantities of radioactive materials from several buildings, especially from the Chemistry and Metallurgy Research (CMR) Building (Building 03-29). Radiological consequences are estimated to result in a maximum dose of approximately 30 Roentgen equivalent man (rem) at the tract.

The postulated site wildfire scenario would burn about 8,000 acres (3,240 hectares) within LANL boundaries, or about 30 percent of LANL, including most of Mortandad Canyon and parts of Los Alamos and DP Canyons east of TA 21. Chemical releases would be less severe than in the postulated earthquake scenarios. The largest quantities of radioactive materials would be released from the transuranic (TRU) waste storage domes at Area G. The maximum dose at TA 21 is estimated to be about 0.1 rem. Such a wildfire has an estimated frequency of 0.1 per year, or once every 10 years.

Because there are no residents and no public workers at the tract, the estimated tract collective dose and estimated excess LCF are both zero for all five natural event accident scenarios.

10.1.13 Environmental Justice

Any disproportionately high and adverse human health or environmental effects on minority or low-income populations that could result from the actions undertaken by the DOE are assessed for the 50-mile (80-kilometer) area surrounding LANL, as described in Chapter 3, Section 3.2.1.14.

10.2 No Action Alternative

10.2.1 Land Use

There would be no anticipated changes to land use at the TA 21 Tract under the No Action Alternative. TSTA and TSFF operations occurring in the DP East area of the tract would continue consistent with future LANL projections (DOE 1999c). Tritium research activities would occur within the existing facilities or in adjacent areas of previously disturbed lands associated with those operations. There would be no anticipated change in access to the site, and the office building would continue to be used.

10.2.1.1 Environmental Restoration

Characterization and cleanup of this tract would take place as described in the DOE's *Accelerating Cleanup: Paths to Closure* (DOE 1998c) or similar plans. The plan focuses on completing work at as many contaminated sites as possible by the end of fiscal year 2006. The plan includes input from all major field sites, including LANL.

The DOE has developed preliminary information based on current knowledge of contamination at the TA 21 Tract, as briefly discussed in the Affected Environment portion of this chapter, Section 10.1.1.1. Information includes estimates of sampling and cleanup costs, decommissioning costs, types and volumes of wastes that would be generated, and length of time required to

effect the cleanup. An overview of this preliminary information is set forth in Appendix B of this CT EIS. All information has been extracted from the Environmental Restoration Report (DOE 1999b).

This information indicates PRS cleanup is likely to include removal actions, in situ treatment, and in situ containment. It is likely that all structures would be razed, and contaminated sediments are likely to be removed from both canyon systems. Although schedule estimates have not yet been prepared for cleanup of the canyon systems, cleanup of PRSs is estimated to require 7 years, while demolition of structures is estimated to require 12 months. Waste volumes are projected to range up to approximately 9,290 cubic yards (7,090 cubic meters) from cleanup of PRSs to approximately 56,560 cubic yards (43,220 cubic meters) from decommissioning and razing of structures. The cost estimate for remedial action at this parcel is about $400,184,000. This estimate is based on the information currently available for each PRS or structure, and is subject to change if significantly different information is discovered during the course of investigation or remediation. It should be noted that all PRSs, including those at which no remediation is ultimately required, must be characterized, and the results must be reported to the administrative authority. As a consequence, there are almost always costs and wastes associated with PRSs that do not require actual "cleanup." Although different cleanup approaches have been identified, it is possible that the administrative authority could require additional actions, resulting in greater waste volumes, a longer cleanup duration, and higher costs. It also should be noted that environmental restoration actions and costs represent only a portion of the actions and total costs that may be required for conveyance and transfer of this parcel. These additional costs may be significant.

10.2.2 Transportation

The No Action Alternative would result in no significant changes in traffic volume on DP Road near the site. It is expected that the future operational performance of DP Road and Trinity Drive would remain similar to that of current performance.

10.2.3 Infrastructure

The impacts of the No Action Alternative for the TA 21 Tract are the same as the impacts described in the Expanded Operations Alternative of the LANL SWEIS (DOE 1999c). Operations at the TSTA and TSFF would continue for at least 10 years. No new environmental impacts are anticipated as a result of the No Action Alternative.

10.2.4 Noise

In the No Action Alternative, TA 21 current uses would continue. There would be some increase in operations from current levels, but daytime noises are expected to be largely unchanged (that is, somewhat less than 50 dBA).

10.2.5 Visual Resources

Under the No Action Alternative, it is expected that the visual resources of this tract would remain the same. The class designation for this tract is Scenic Class IV, which indicates visual resources of low public value.

10.2.6 Socioeconomics

Under the No Action Alternative, there would be no anticipated changes in land use or change in employment on the tract.

10.2.7 Ecological Resources

Under the No Action Alternative, there would be no changes in land use at the TA 21 Tract, as described in Section 10.1.1. Therefore, no impact to ecological resources are projected under the CT EIS No Action Alternative.

10.2.8 Cultural Resources

Under the No Action Alternative, the TA 21 Tract would remain under the responsibility of the DOE, and the treatment of any cultural resources present would continue to be subject to Federal laws, regulations, guidelines, executive orders, and Pueblo Accords. The use of the TA 21 facilities, which may include potentially eligible resources, would continue. Planned evaluation of these structures would continue, and information would be available to the DOE to ensure stewardship of these resources. Other positive impacts of the No Action Alternative would be the passive preservation of resources due to lack of development. Ongoing negative impacts from natural processes (such as erosion, fire, seismic events, and aging of buildings) on the physical integrity of cultural resources would continue.

10.2.9 Geology and Soils

Consequences are limited to existing uses. The tract is already developed; no additional utilities, roadwork, or buildings are required. No soil disturbance or change in availability of resources are anticipated.

10.2.10 Water Resources

Continuation of the current use of this tract by the DOE is anticipated under this alternative. Consequences to water resources under the No Action Alternative would be no different than those already existing in the affected environment.

10.2.11 Air Resources

In the No Action Alternative, LANL operations would continue at TA 21. Emissions of criteria pollutants would continue; but the highest estimated concentration of each pollutant would be below Federal and State standards established to protect human health, with an ample margin of safety. Both short-term and long-term exposures to emissions of hazardous and other chemical air pollutants would be within levels established by health-based standards (DOE 1999c, Chapter 5). Doses from radioactive air pollutants would increase to approximately 2.5 to 4.0 millirem per year.

The same land use would exist in the No Action Alternative (tritium research), but the level of activity is expected to be slightly greater. As a result, carbon dioxide emissions also should increase somewhat from current levels of 7,400 tons (6,712 metric tons) per year to an estimated 7,800 tons (7,075 metric tons) per year.

10.2.12 Human Health

There would be no identifiable human health consequences to the public from implementation of the No Action Alternative for the TA 21 Tract. No changes in cancer risk should be expected for this alternative. Estimated radiation doses received at this tract would be approximately double from today's levels, ranging from 2.5 millirem (at the western edge) to 4.0 millirem (at the eastern edge) per year at the TA 21 Tract (DOE 1999c, Chapter 5). Doses would remain, however, within the EPA standard of 10 millirem per year (DOE 1999c, Chapter 5). No significant nonradiological increases in exposures would be expected. It is presumed that visitors would have adequate time to evacuate the premises for wildfires. Because warnings are usually not given for seismic events, the human health impacts due to seismic events likely would be greater than the other two natural disasters. The primary type of human health risk for natural disasters would be physical injury from falling debris and fires. No changes in cancer risk should be expected for this alternative.

10.2.12.1 Chemical Accidents

Accident assessment would be the same as discussed in the Affected Environment section in this chapter. For all postulated

accidents, chemical concentrations in the air plume released by potential chemical accidents would be below both ERPG-3 (life-threatening) and ERPG-2 (serious health effects) by the time the air plume reaches TA 21, even under adverse weather dispersion conditions. Accordingly, chemical accidents would have no estimated public consequences at the tract.

10.2.12.2 Radiological Accidents

Accident assessment would be the same as discussed in the Affected Environment section in this chapter. MEI doses would be greater than 500 millirem for 3 of 13 scenarios postulated in the LANL SWEIS. Doses would be received by LANL employees. The estimated tract collective dose and estimated excess LCF would both be zero for nonemployees.

10.2.12.3 Natural Event Accidents

Accident assessment would be the same as discussed in the Affected Environment section in this chapter. Neither the wildfire nor any of the earthquakes would have chemical consequences, even under adverse weather dispersion conditions. The MEI dose resulting from the postulated wildfire would be about 0.1 rem; the maximum dose from the most severe earthquake would be approximately 30 rem. Because there are no residents and no public workers at the tract, the estimated tract collective dose and estimated excess LCF would both be zero for all five natural event accident scenarios.

10.2.13 Environmental Justice

For environmental justice impacts to occur, there must be high and adverse human health or environmental impacts that disproportionately affect minority or low-income populations. The human health analyses estimate that air emissions and hazardous chemical and radiological releases from normal LANL operations, which would continue under the No Action Alternative, would be expected to be within regulatory limits, and no excess LCFs would likely result. The human health analyses also indicate that radiological releases from accidents at LANL would not result in disproportionate adverse human health or environmental impacts. Therefore, such accidents would not have disproportionately high and adverse impacts on minority or low-income populations.

The analyses also indicate that socioeconomic changes resulting from implementing the No Action Alternative would not lead to environmental justice impacts. Employment and expenditures would remain unchanged from the baseline.

10.3 Proposed Action Alternative

10.3.1 Land Use

Direct land use consequences of the transfer of this tract would include the relocation of LANL personnel who currently work at TA 21. Relocated personnel who currently work in office buildings would likely be moved to existing buildings on other parts of LANL property, possibly to new mobile manufactured buildings on an existing parking lot at TA 16. Due to recently identified mission support requirements for the TSTA and TSFF facilities at TA 21 beyond the 10-year timeframe established by the Act (Public Law 105-119), the tritium facilities and inventory would not be expected to move from TA 21. Planning for any removal actions needed later has not begun, and possible alternative locations are unknown. Environmental media monitoring stations would require relocation to other locations within LANL boundaries. The direct impacts would be minor and would be bounded by the indirect impacts. Construction of new facilities necessarily would be preceded by appropriate NEPA reviews that may result in the preparation of an

environmental assessment or an environmental impact statement.

10.3.1.1 Description of Contemplated Uses

The commercial and industrial development land use scenario proposed for this tract could include the development of at least 55 acres (22 hectares) of the mesa, primarily in areas that have been previously disturbed (see Figure 10.3.1.1-1). Immediately off the mesa top, slopes are generally too steep (greater than 20 percent) to accommodate development. The attributes of future land use for the TA 21 Tract under the commercial and industrial land use scenario include:

- A minimum of 55 acres (22 hectares) would be developed for commercial and industrial uses.
- Commercial uses could include both light and heavy commercial businesses such as office buildings and business parks, warehouses, parking areas, service stations, repair garages, tire shops, motels and hotels, large stores, and drive-in or take-out facilities, and/or other similar businesses.
- Industrial uses could include light fabrication and manufacturing facilities compatible with other uses currently located at and adjacent to the site.
- When fully developed, land would be occupied by 70 businesses, 1,900 employees, and 56 commercial vehicles.

10.3.1.2 Environmental Consequences of the Contemplated Uses

There would be little or no indirect environmental consequences from the contemplated land uses because land uses would remain commercial and industrial. The location and type of future enterprises would need to be consistent with existing and adjacent land use. Access to and within the eastern portions of the site would be expected to improve.

10.3.1.3 Environmental Restoration

No additional environmental restoration actions would be required under the Proposed Action Alternative because restoration activities must occur before the tract would be considered suitable for conveyance or transfer.

10.3.2 Transportation

There would be few direct transportation impacts resulting from implementation of this development scenario. Relocation of TA 21 functions would alter the daily commute of LANL and contractor personnel currently employed at TA 21. Depending upon their new work location and their place of residence, personnel would have either a shorter or longer drive to work. Indirect consequences are discussed in the following sections.

10.3.2.1 Environmental Consequences of the Contemplated Uses

The commercial and industrial land use scenario anticipates development of additional commercial and industrial facilities at the TA 21 site. The Institute of Transportation Engineers (ITE) land use code utilized to estimate the trips generated by this proposed development was 130, Industrial Park. This ITE land use code allows estimation of the trips generated by these facilities based on the number of acres proposed for the land use type.

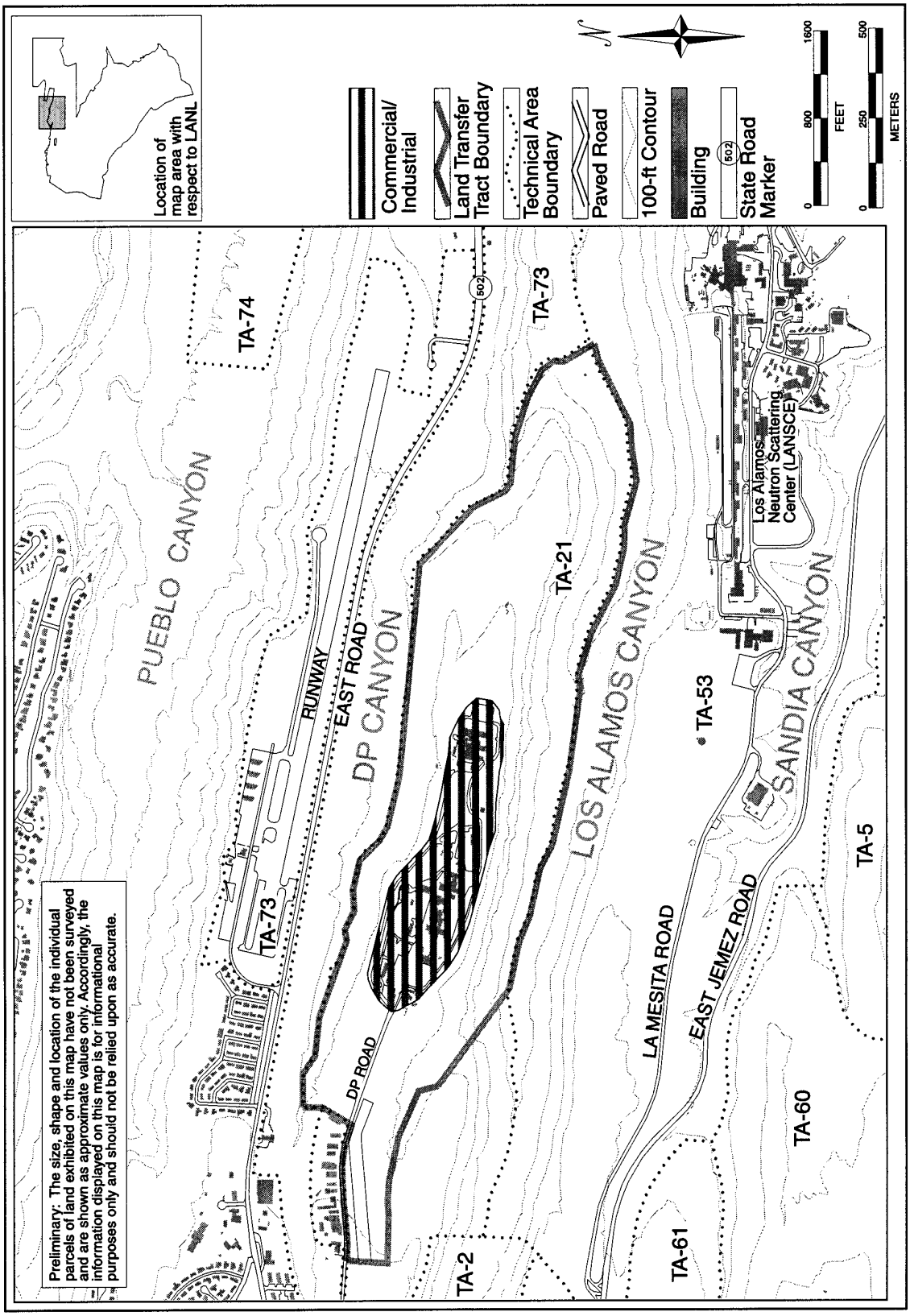

Figure 10.3.1.1-1. Technical Area 21 Contemplated Land Uses.

Table 10.3.2.1-1 shows the number of trips the ITE Trip Generation Manual (ITE 1997) estimates would be generated by this development. As shown in the table, the proposed development would add an additional 464 entering trips to DP Road and State Road 502 in the weekday morning peak hour and add an additional 455 exiting trips in the weekday evening peak hour. This land use scenario also may add an additional 3,471 trips to the local transportation system.

Adding these trips to those already on the transportation network would result in approximately 17,500 trips on State Road 502. The LOS for the two-lane section of Trinity Drive and East Road would be LOS E with the commercial and industrial development land use scenario around the year 2018. This LOS represents the maximum capacity of the road and is the operating condition just prior to traffic jam conditions. It is likely that the DP Road-Trinity Drive intersection would not be adequate in its current configuration, and reconstruction of this intersection would be necessary, possibly including the addition of a traffic signal.

The construction of a bridge connecting the eastern edge of the TA 21 Tract with the Airport Tract would be possible. This connection would improve the ingress and egress to the proposed DP Road commercial area, including this site. This also would alleviate the traffic problems that currently exist where DP Road intersects with Trinity Drive. However, it would increase the number of trips at the Airport Road and East Road intersection. This scenario would likely require the installation of a traffic signal at the Airport Road-East Road intersection.

Transportation effects within LANL from the relocation of personnel from TA 21 to their new facilities would be increases in traffic congestion during peak morning and evening hours in the immediate area of the new facilities. Because of the relatively small number of personnel relocated (in relation to the total number of LANL employees), no noticeable changes would be expected on a site-wide scale.

10.3.3 Infrastructure

There would be minimal direct consequences to infrastructure from the Proposed Action Alternative because utility needs would be relocated, not terminated. For example, it would be likely that the TA 21 steam plant would be reproduced elsewhere, with the same consumption of natural gas as the existing steam plant.

Table 10.3.2.1-1. Estimated Increase in Traffic for the Commercial and Industrial Development Land Use Scenario

ITE ESTIMATED TRAFFIC VOLUMES FOR TA 21 TRACT								
Land Use	ITE Land Use Code	24 Hour Two-Way Volume	Morning Peak Hour Trips		Evening Peak Hour Trips		Saturday Peak Hour Trips	
			Enter	Exit	Enter	Exit	Enter	Exit
Industrial – 55 acres (23 hectares)	130	3,471	464	95	121	455	83	176

10.3.3.1 Environmental Consequences of the Contemplated Uses

Indirect environmental impacts with respect to utilities and infrastructure resulting from this alternative would fall into two categories: (1) increased utility usage and (2) ground disturbance resulting from construction of new facilities. The utility usage would increase as a result of the contemplated developments. The estimated increases are shown in Table 10.3.3.1-1. It is not anticipated that these increases would exceed the capacity for any utility in the region.

Installation of new utility facilities and upgrades to existing ones would require creation of trenches and access and maintenance roads. The construction of roads, parking areas, and buildings, and the extension of utility lines would cause soil disturbance. Refer to Section 10.3.9 of this chapter for detail on impacts resulting from ground disturbance from new construction.

10.3.4 Noise

Transfer of ownership would have some direct impact to noise levels at the TA 21 Tract. Noises created by existing ventilation systems and by the movement of vehicles would disappear, and noise levels would decrease on parts of the tract. Traffic along East Road, however, is the primary noise source on northern portions of this land tract, and these traffic noises would remain. Indirect consequences are discussed in the following sections.

10.3.4.1 Environmental Consequences of the Contemplated Uses

If conveyed, the TA 21 Tract would be developed both commercially and industrially. This development would likely result in an increase in jobs, which would increase traffic flow. Maximum noise from traffic would not be expected to increase significantly over current conditions, but traffic noises would likely be present for a greater portion of the day as the new employees arrive at work, exit and return from lunch, perform daily errands, and return home in the afternoon.

Construction of the new commercial and industrial facilities would, however, increase ambient noise levels. Construction of new facilities would entail ground clearing, excavation, laying of foundations, erection, and finishing work. The use of heavy equipment such as front-end loaders, concrete mixers, and jackhammers would produce

Table 10.3.3.1-1. Estimated Increase in Utility Usage for the Commercial and Industrial Land Use Scenario on the TA 21 Tract

	POWER MW	ELECTRICITY GWH	GAS MCF (MLY)	WATER MGY (MLY)	SEWAGE (BAYO) MGY (MLY)	MSW TPY (MTY)
Estimated annual increase	0.7	4.0	39 (1,100)	35 (132)	19 (72)	77 (70)
Available system capacity	5	277	5,040 (142,700)	297 (1,125)	135 (511)	NA

Notes: mw = megawatts, gwh = gigawatt-hours, mcf = million cubic feet, mly = million liters per year, mgy = million gallons per year, tpy = tons per year, msw = municipal solid waste, mty = metric tons per year

noise levels ranging from 74 to 95 dBA at a distance of 50 feet (15 meters) from the construction site (DOE 1997a, page 36).

10.3.5 Visual Resources

One direct consequence to visual resources of conveyance or transfer of ownership would be the demolition of LANL structures on the tract prior to disposition. These actions would result in visual improvement to the area.

10.3.5.1 Environmental Consequences of the Contemplated Uses

Contemplated uses would be visually compatible with current tract use and would maintain or could improve current Scenic Class IV visual resources by the replacement of less visually appealing structures.

10.3.6 Socioeconomics

Because TA 21 activities would be relocated (as opposed to terminated), there would be no direct socioeconomic consequences of the Proposed Action Alternative.

10.3.6.1 Environmental Consequences of the Contemplated Uses

Indirect socioeconomic consequences would include short-term increases in area employment and income associated with the construction of the facilities and long-term increases once the facilities are operational. Approximately 1,900 workers would be employed on the tract and 3,100 jobs would be generated in the ROI, which would, in turn, increase ROI income. Because these jobs would be filled by the existing ROI labor force, there would be no impact on area population or increase in the demand for housing or public services in the ROI.

10.3.7 Ecological Resources

Direct ecological impacts of the conveyance or transfer itself would be limited to the changes in responsibility for resource protection. Environmental review and protection processes for future activities would not be as rigorous as those which govern DOE activities.

The LANL Threatened and Endangered Species Habitat Management Plan would no longer be in effect for this area—thereby potentially reducing the protection afforded threatened and endangered species and their potential habitat in this area.

10.3.7.1 Environmental Consequences of the Contemplated Uses

Approximately 20 percent, or 52 acres (21 hectares) of the TA 21 Tract are currently developed. Commercial and industrial facilities would be constructed primarily within the developed areas and would replace many of the existing structures. Contemplated development would destroy or substantially modify at least 5 additional acres (2 hectares) of habitat, primarily ponderosa pine, pinyon-juniper, shrub, grassland, and wildflower areas. Highly mobile wildlife species or wildlife species with large home ranges (such as deer, elk, and birds) would be able to relocate to adjacent undeveloped areas; however, successful relocation may not occur due to competition for resources to support the increased population and the carrying capacity limitations of areas outside the proposed development area. The impacts could include overgrazing, stress, and overwintering mortality. For less-mobile species (reptiles, amphibians, and small mammals), direct mortality could occur during the actual construction event or from habitat alteration. Development would reduce breeding and foraging habitat for wildlife currently utilizing the property and would be lost as potential hunting habitat for raptors and other predators. In addition, there would be a decrease in quality of the habitat

immediately adjacent to the proposed development due to increased noise level, traffic, lights, and other human activity, both pre- and post-construction.

Development in this tract could result in the accelerated loss of wetland vegetation present at the decommissioned industrial outfalls and loss of the small wetlands within both the TA 21 and Airport Tracts. Even if construction and development does not occur in the TA 21 or Airport Tracts' wetland, indirect impact such as additional surface runoff from an increase of impermeable surface areas (pavement), resulting in accelerated erosion and increased downstream and offsite sedimentation could occur.

There are three species that are Federal-listed as threatened or endangered that may potentially use the TA 21 Tract: the bald eagle, American peregrine falcon, and the Mexican spotted owl. With respect to the bald eagle, this area has a low level of potential use for foraging. Three Mexican spotted owl AEIs (Los Alamos Canyon, Pueblo Canyon and Sandia Canyon AEIs) overlap the TA 21 Tract, and development could affect approximately 133 acres (54 hectares) of core habitat (Los Alamos Canyon AEI) and buffer habitat comprised of approximately 92 acres (37 hectares) in the Los Alamos Canyon AEI, 63 acres (26 hectares) in the Pueblo Canyon AEI, and 18 acres (7 hectares) in the Sandia Canyon AEI. Two American peregrine falcon AEIs could be affected: 15 acres (6 hectares) of core habitat and 127 acres (51 hectares) of buffer habitat in the Pueblo Canyon AEI and 11 acres (4 hectares) of core habitat in the Los Alamos Canyon AEI (PC 1999d).

Because direct entry into the adjacent Los Alamos Canyon habitat would be available by descending established trails, increased recreational use is expected occur. However, recreational effects to the adjacent Los Alamos Canyon natural habitat are projected to be minor because the area is proposed for commercial development and not residential or recreational use.

The watershed management approach to natural resource management requires the integration of natural resource management plans across several land management agencies. The current lack of a natural resources management plan by either the County of Los Alamos or the Pueblo of San Ildefonso would impede the development of an integrated, multiagency approach to short- and long-term natural resource management strategies for the Los Alamos Canyon watershed.

10.3.8 Cultural Resources

Direct impacts of the conveyance and transfer itself would result from the potential transfer of known and unidentified cultural resources out of the responsibility and protection of the DOE.

First, under the Criteria of Adverse Effect (36 Code of Federal Regulations [CFR] 800.5(a)(1)), the transfer, lease, or sale of NRHP-eligible cultural resources out of Federal control is an adverse effect. Eligible cultural resources are present in the TA 21 Tract and thus could be directly impacted by the Federal action.

Second, the conveyance and transfer of this tract could potentially impact the cultural resources by removing these resources from future consideration under the *National Historic Preservation Act*.

Third, the disposition of this tract may affect the protection and accessibility to Native American sacred sites and sites needed for the practice of any traditional religion by removing them from consideration under the *Religious Freedom Restoration Act, American Indian Religious Freedom Act,* and Executive Order 13007, "Indian Sacred Sites." Finally, the disposition of this tract would affect the treatment and disposition of any human remains, funerary objects, sacred objects, and objects of cultural patrimony that may be

discovered on the tract. This impact would result from removing these items from consideration under the *Native American Graves Protection and Repatriation Act*, or from changing the way this act is applied to these remains and objects. Indirect consequences are discussed in the following paragraphs.

10.3.8.1 Environmental Consequences of the Contemplated Uses

Indirect impacts would be anticipated from the land use contemplated for the TA 21 Tract by the receiving parties. The receiving parties have identified a combination of commercial and industrial land uses on a minimum of 55 acres (22 hectares) of the tract. This analysis reflects the broad, planning-level impacts anticipated from this contemplated use.

Under the commercial and industrial development scenario, portions of the tract would be extensively altered by construction activities, including grading and trenching. These activities could result in primary impacts to NRHP-eligible resources through physical destruction, demolition, damage, or alteration. Resources avoided by construction on adjacent lands may be isolated or have their setting disturbed by the introduction of elements out of character with the resource, such as visual and audible intrusions. The development of land may cause changes to the presence or integrity of, or access to natural resources utilized by traditional communities for subsistence, religious, or other cultural activities.

10.3.9 Geology and Soils

There would be no direct consequences of transfer of ownership of the TA 21 Tract. Indirect consequences would be as discussed in the following sections.

10.3.9.1 Environmental Consequences of the Contemplated Uses

The contemplated land use includes commercial and industrial development activities. There would be little to no anticipated change in land use under this scenario for the TA 21 Tract. Impacts to geology and soils would be limited to disturbances resulting from any upgrade to utilities and roadways.

10.3.10 Water Resources

Transfer of this tract may directly affect surface water quantity. Transfer would not directly affect surface water quality or groundwater quantity or quality.

10.3.10.1 Environmental Consequences of the Contemplated Uses

Surface water quantity and quality may be indirectly affected if the contemplated land use is pursued. The contemplated land use would not affect groundwater quality or quantity beneath the tract, but any associated increased water usage may contribute to the overall regional water level decline and possibly result in degradation of water quality within the aquifer.

Development and construction may potentially affect surface water quality within and downstream of the tract. Two sources of surface water, the NPDES-permitted outfalls associated with TA 21 operations, would be removed prior to disposition of the tract. This would reduce the quantity of surface water discharged into the adjacent canyons. Surface water quality could be impacted during construction and development of the tract as stormwater runoff may increase over areas that have been denuded and carry sediments and surface contaminants into the drainages. Possible mitigative measures are discussed in Chapter 16, Potential Mitigation Measures.

10.3.11 Air Resources

From a regional perspective, there would likely be a slight beneficial direct impact to air quality from the Proposed Action Alternative. LANL activities would be relocated, not terminated, and the tritium research facilities would be reconstructed. It is probable that newer process designs and newer emission control technologies would be installed. As a result, emissions of chemical and radiological air pollutants might decrease slightly from levels in the No Action Alternative. There would be little or no change to emissions of criteria pollutants. Indirect consequences are discussed in the following paragraphs.

10.3.11.1 Environmental Consequences of the Contemplated Uses

Under the Proposed Action Alternative, LANL facilities would be idled and then razed. New businesses potentially would include warehouses, service stations, repair garages, motels, stores, and office buildings. The result of this transformation would be a likely increase in emissions of criteria pollutants, a probable reduction in emissions of hazardous and other chemical air pollutants, and the elimination of radioactive air pollutants from TA 21. In short, air quality would improve somewhat.

Despite increased emissions of criteria pollutants, ambient air concentrations would likely continue to below standards established by the EPA and the State. With the removal of LANL operations, concentrations of hazardous and chemical air pollutants, which are already lower than health-based standards, would decrease. Doses from the inhalation of radioactive air pollutants would continue at approximately 2.5 to 4.0 millirem per year because most of this dose is the result of operations at the LANSCE, not the idled TA 21 operations.

10.3.11.2 Global Climate Change

It is assumed that this development would result in four office buildings (20 firms) and 50 commercial and industrial businesses. In turn, these businesses would require an estimated 56 commercial vehicles, a combination of vans, pick-up trucks, and automobiles. LANL facilities would be razed. Carbon dioxide emissions would result from the use of natural gas to heat buildings and through the use of commercial vehicles. Resultant emissions are estimated to be 2,500 tons (2,267 metric tons) of carbon dioxide per year. This would be a two-thirds reduction from emissions in the No Action Alternative, caused largely by the cessation of LANL activities. (The reduction would be for this tract alone, however. Regionally, carbon dioxide emissions could increase by 2,500 tons [2,267 metric tons] per year should tritium research continue elsewhere on LANL property.)

10.3.12 Human Health

There would be few direct impacts to human health from transfer of ownership of the TA 21 Tract. Tritium research activities would be assumed to be relocated to another LANL technical area, likely more distant from population centers than TA 21. However, because more than 90 percent of the dose to the regional populace stems from research at the LANSCE, this relocation would have little impact. Potential indirect consequences are discussed in the following sections.

10.3.12.1 Environmental Consequences of the Contemplated Uses

Commercial development would bring an estimated 1,900 new workers into closer proximity to LANL facilities, thereby increasing the number of members of the public exposed to radiological and chemical air pollutants emitted by LANL operations. While all doses would be within health-based standards established by other Federal

agencies, the closer proximity would increase the radiation dose received by the collective population within a 50-mile (80-kilometer) radius of LANL. In addition, closer public proximity would result in greater public consequences from some hypothetical accidents at LANL facilities.

Radiation doses received by workers would range from 2.5 millirem (at the western edge) to 4.0 millirem (at the eastern edge) per year at this tract (DOE 1999c, Chapter 5). Because this tract lies within the radiation site evaluation circle for the LANSCE, however, potential radiological impacts of the disposition and subsequent development may warrant additional consideration.

No changes in cancer risk should be expected. Nonradiological exposures would be expected to be below health-based standards. Residents would face the same hazards to floods and wildfires as workers now do but should have adequate time to evacuate the premises. Seismic events come without warning and would carry risks of physical injury from building collapses.

10.3.12.2 Chemical Accidents

Accident assessment would be the same as described in the No Action Alternative. For all postulated accidents, chemical concentrations in the air plume released by potential chemical accidents would be below both ERPG-3 (life-threatening) and ERPG-2 (serious health effects) by the time air plume reached TA 21, even under adverse weather dispersion conditions. Accordingly, chemical accidents would have no estimated public consequences at the tract.

10.3.12.3 Radiological Accidents

Subsequent to transfer of ownership, the MEI dose at this tract would be the same as described in the No Action Alternative. The MEI doses would be greater than 200 millirem for 4 of 13 scenarios postulated in the SWEIS: 17 rem for RAD-02 (natural gas pipeline failure, explosion, and fire at the CMR Building), 220 millirem for RAD-07 (fuel leak and fire at the Waste Characterization, Reduction, and Repackaging [WCRR] Facility), 8 rem for RAD-12 (plutonium release from the Dual Axis Radiographic Hydrodynamic Test [DARHT] Facility during an earthquake), and 1.2 rem for RAD-15B (explosion followed by fire in an entire wing of the CMR Building).

For the contemplated commercial and industrial development land use, there would be substantial increases in collective tract dose and excess LCFs. For example, the LANL SWEIS estimated a collective population dose of 120,000 person-rem for all people living within a 50-mile (80-kilometer) radius of LANL, resulting in an estimated 57 excess LCFs for hypothetical accident RAD-02. This would increase by another 8,000 person-rem and four LCFs under the commercial and industrial development land use. Table 10.3.12.3-1 compares the estimated additional consequences of all hypothetical radiological accidents.

10.3.12.4 Natural Event Accidents

Natural event accidents would have no estimated chemical consequences at the TA 21 Tract. For the postulated accidents (wildfire and four earthquake scenarios), chemical concentrations in the air plume released by potential chemical accidents would be below both ERPG-3 (life-threatening) and ERPG-2 (serious health effects) by the time any air plume would reach the tract, even under adverse weather dispersion conditions.

The MEI doses would be the same as described in the No Action Alternative. The maximum dose resulting from the postulated wildfire would be about 0.1 rem; that from the most severe earthquake would be about 30 rem. If the tract were developed commercially, however, there would be significant increases in collective tract dose

Table 10.3.12.3-1. Additional Accident Consequences Associated with the Commercial and Industrial Land Use on the TA 21 Tract

				BOTH DEVELOPMENT SCENARIOS[a]		SWEIS ESTIMATES[b]	
Accident Scenario	Accident Location	Facility	Frequency per Year	Collective Dose[c]	Excess LCF	Collective Dose[c]	Excess LCF
RAD-01	54-38	RANT	1.6×10^{-3}	57	0.03	72	0.04
RAD-02	03-29	CMR	1.5×10^{-6}	8,000	4.0	120,000	57
RAD-03	18-116	Kiva #3	4.3×10^{-6}	48	0.02	100	0.06
RAD-05	21-209	TSTA	9.1×10^{-6}	NA[d]	NA[d]	24	0.01
RAD-07	50-69	WCRR	3.0×10^{-4}	120	0.06	1,300	0.69
RAD-08	54-230	TWISP	4.3×10^{-6}	74	0.04	400	0.2
RAD-09A	54-226	TWISP	4.9×10^{-1}	1	0	4	0
RAD-09B	54-226	TWISP	4.9×10^{-3}	47	0.02	230	0.12
RAD-12	16-411	--	1.5×10^{-6}	4,700	2.3	35,800	18
RAD-13	18-116	Kiva #3	1.6×10^{-5}	70	0.04	160	0.08
RAD-15A	03-29	CMR	3.6×10^{-5}	32	0.02	175	0.09
RAD-15B	03-29	CMR	3.2×10^{-5}	570	0.29	3,400	1.7
RAD-16	03-29	CMR	3.5×10^{-6}	2	0	56	0.03

Notes: mrem = millirem, RANT = Radioactive Assay and Nondestructive Test, TWISP = Transuranic Waste Inspectable Storage Project

[a] In addition to doses estimated in the LANL SWEIS.

[b] For the entire population within a 50-mile (80-kilometer) radius of LANL.

[c] Person-rem

[d] Not applicable. Accident could not occur at TA 21 if land were transferred.

and excess LCFs. The most severe earthquake would result in an estimated tract collective doses greater than 20,000 person-rem, and in approximately 12 excess LCFs. These exposures would be in addition to those estimated in the LANL SWEIS (340,000 person-rem and 230 excess LCFs for SITE-03B).

10.3.13 Environmental Justice

There would be no direct or indirect consequences of the Proposed Action Alternative. For environmental justice impacts to occur, there must be high and adverse human health or environmental impacts that disproportionately affect minority or low-income populations. The human health analyses for the contemplated land uses estimate that air emissions and hazardous chemical and radiological releases from LANL operations would be expected to be within regulatory limits, and no excess LCFs would likely result. The human health analyses also indicate that radiological releases from accidents would not result in disproportionate adverse human health or

environmental impacts. Therefore, such accidents would not have disproportionately high and adverse impacts on minority or low-income populations with regard to implementing the contemplated land uses on the tract.

The analyses also indicate that socioeconomic changes resulting from implementing the Proposed Action Alternative would not lead to environmental justice impacts. Under the Proposed Action Alternative, modest economic benefits would arise from the additional jobs created during construction and operation of the new facility. Secondary effects would include small increases in business activity and would likely increase revenues to local governments. Each of these impacts would be positive and would not disproportionately affect low-income or minority populations.

The analysis of impacts to cultural resources indicates that TCPs could be present on the tract or in adjacent areas. If present, TCPs could be impacted by the conveyance or transfer or by subsequent land uses. Consultations to determine the presence of these resources have not been completed, and the degree to which these resources may be impacted has not been ascertained. Impacts to TCPs potentially may cause disproportionately high or adverse effects on minority or low-income communities, but these effects cannot be determined at this point in the consultation process.

10.3.14 Irreversible and Irretrievable Commitment of Resources

This section describes the major irreversible and irretrievable commitments of resources that can be identified at the level of analysis conducted for this CT EIS. A commitment of resources is irreversible when its primary or secondary impacts limit the future options for a resource. An irretrievable commitment refers to the use or consumption of a resource that is neither renewable nor recoverable for use by future generations.

The actual conveyance or transfer of the TA 21 Tract would not immediately cause any irreversible or irretrievable commitments of resources. Subsequent commercial and industrial development would, however, cause the irretrievable commitment of resources during construction and operation of new businesses. Construction of these buildings would require the irretrievable commitment of standard building materials such as lumber and roofing materials. Energy would be expended in the form of natural gas and electricity. Additional water also would be consumed.

10.3.15 Unavoidable Adverse Environmental Impacts

The actual conveyance or transfer of the TA 21 Tract could result in the loss of certain Federal protections for cultural resources on the tract. Loss of these protections could be considered an unavoidable adverse impact to these resources, as development of previously undisturbed areas could result in physical destruction, damage, or alteration of cultural resources on the tract. The conveyance or transfer of the tract also could result in the loss of certain Federal protections for ecological resources and consideration of these resources in planning future activities on the tract.

Development also would cause adverse impact through increased need for and use of utilities. Increased demand for water, solid waste, and sewage services would have adverse effects in the immediate Los Alamos region by lowering the aquifer level more quickly, shortening the remaining lifetime of the County landfill, and increasing both the quantities of sewage that require treatment and the quantities of treated sewage discharged to the environment. The environmental effects of increased demand for electricity and natural gas would be felt

elsewhere (in the Four Corners region, for example), in the form of increased emissions of air pollutants in order to generate electricity. Increased consumption of natural gas adds to global climate change through increased emissions of carbon dioxide.

Development also would lead to increases traffic by increasing the labor force within the County. The addition of an estimated 1,900 new workers would in a 10 to 15 percent increase in commuter traffic, with attendant increases in congestion and traffic noises during daylight hours. Noise levels would increase within the TA 21 Tract because the current work force is less than one-fourth that projected subsequent to development. The visual environment would deteriorate from that created by the demolition of existing LANL structures (although more modern architectural designs might result in visual improvement when compared to that of today).

Finally, development would bring more members of the public into closer proximity to LANL facilities, thereby increasing the number of people exposed to radiological and chemical air pollutants emitted by LANL operations. The location is not far from the Small Business Center Annex (on East Gate Drive), the location of LANL's MEI, due to radiological air emissions from the LANSCE on the adjacent mesa. While all doses would be within health-based standards established by other Federal agencies, the closer proximity also would increase the radiation dose received by the collective population within a 50-mile (80-kilometer) radius of LANL. In addition, closer public proximity would result in greater public consequences from some hypothetical accidents at LANL facilities.

Finally, commercial and industrial development would increase the potential for degradation of surface water quality. Standard mitigation measures, however, can limit both short- and long-term impacts to surface water quality.

10.3.16 Relationship Between Local Short-Term Use of the Environment and the Maintenance of Long-Term Productivity

The actual conveyance or transfer of TA 21 Tract would not immediately cause any specific impacts on short-term uses of the environment. Environmental restoration activities at the tract, already completed before ownership is transferred, would cause some short-term disruption and use of resources but would ultimately provide for long-term improvement in environmental quality and associated productivity. Demolition of LANL facilities also would lead to improvements in the visual environment.

The tract is located immediately adjacent to the Los Alamos townsite, and land use has been commercial and industrial for five decades. Continued commercial and industrial land use would, therefore, be compatible with the long-term uses of the land.